**Weather and Climate Big Questions-Rate Yourself**

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| **Big Questions** | **2** | **3** | **4** | **5** |
| Why is water vapor not usually included in the list of the most abundant gases in the atmosphere? |  |  |  | The amount of water vapor in air **is variable** and is referred to as relative humidity. Dry air has very little WV, humid air has a very high composition of WV. |
| Use your knowledge of the atmosphere to explain why climbing Mt Everest is so dangerous. |  |  |  | It’s hard to breathe – air density decreases with increasing altitude because pressure also decreases (there is less air above in the atmosphere to create pressure at higher altitudes). Therefore the oxygen levels get very low.  It’s cold – lower air density results in fewer particles vibrating to produce thermal energy – there is a risk of frostbite, hypothermia and death. |
| If it is 10◦C at the top of a mountain that is 3500m tall, what is the temperature at its base (at sea level)?pg.18 in your text |  |  |  | 6.5◦C per 1000m decrease in temp. So 3.5 x 6.5 = 22.75 degrees warmer, or about 33◦C |
| Is the Greenhouse effect the same as Global Warming? Explain. |  |  |  | The greenhouse effect refers to the absorption of infra red radiation in the atmosphere by greenhouse gases such as carbon dioxide and methane. This absorption produces heat that is necessary for life on earth. Global warming is essentially the “enhanced” greenhouse effect – levels of greenhouse gases have increased because of the burning of fossil fuels and have led to accelerated warming of the atmosphere. |
| Why is there wind? Why is it stronger at times than others? |  |  |  | Wind blows because of differences in pressure (High and Low). Pressure differences are produced by the unequal heating of the earth’s surface. Warmer, sunny areas have heated, rising air (because it’s less dense) that leaves low pressure at the surface. Cooler areas have sinking, dense air and high pressure at the surface. Strong heating produces bigger differences in pressure and stronger winds. |
| Why is it important to know about the prevailing wind direction and air masses when understanding the weather of a specific place? |  |  |  | Weather systems (fronts, pressure areas) move with the prevailing wind. This makes it possible to forecast weather changes by observing weather patterns that may “blow into” an area. If a location is downwind from a specific geographic feather (lake, ocean, desert, rainforest etc) then its weather will be affected by the conditions that geographic feature produces. Eg. If the prevailing wind blows from a warm ocean, then climate and weather patterns may reflect warm, raining conditions. |
| Why is low pressure associated with cloudy skies and high pressure associated with clear ones? |  |  |  | Low pressure develops as air rises. Rising air cools and its moisture condenses into clouds and rain. High pressure develops as air sinks. Sinking air warms and clears (no condensation) |
| If I see clouds develop in this order: Cirrus, Cirrostratus, Altostratus, Nimbostratus; what weather feature is approaching me? Why? |  |  |  | A warm front. The warm air slowly rises over the cold air. As the front approaches, the first clouds you see are high and thin (cirrus). These clouds gradually thicken as the front gets closer until it may rain (nimbostratus) |
| How does the earth’s orbit around the sun create seasons? |  |  |  | As the earth orbits the sun, the sun’s energy changes where it is most concentrated (because of the tilted axis). The timing of seasons follows changes in the amount of sunlight reaching the earth’s surface at different places. When it’s winter in the northern hemisphere – it is summer in the southern hemisphere. Changes in sunlight also affect the amount of rainfall in an area – some places have seasons of wet and dry instead of warm and cold. |

**Weather and Climate Unit Test Check list ✓**

**1.1**

**1. What are the most abundant and important gases in our atmosphere?**

**2. Why is the atmosphere important to life on earth?**

**1.2**

**1. What is atmospheric pressure and what causes it?**

**2. How does pressure change with altitude and how does this affect the properties of air (density and temperature)?**

**1.3**

**1. What are the 4 main layers of the atmosphere? Why do we focus on the troposphere and stratosphere?**

**2.1**

**1. In what forms does energy from the sun travel to Earth?**

**2. What happens to the sun’s energy when it reaches Earth?**

**2.3**

**1. What causes winds?**

**2. How do local and global winds differ?**

**2.4**

**1. What is humidity and how is it important to our understanding of weather?**

**2. What are the major types of clouds and how do they form?**

**2.5**

**1. What are the common types of precipitation?**

**3.1**  
1. What are the 4 major air masses that influence the weather in North America?  
  
2. How are air masses moved?  
  
3. Colliding air masses form fronts. What are the 4 types of fronts that can occur?  
  
4. What are cyclones and what types of weather are associated with them?  
  
5. What are anticyclones and what types of weather are associated with them?  
  
**4.1**  
  
1. What are the main factors that influence temperature?  
  
2. What are the main factors that influence precipitation?  
  
3. What causes the seasons?